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UNITED STATES NAVY

MEDICAL NEWS LETTER

Vol. 40 Friday, 16 November 1962 No. 10

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Policy

The U. S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

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Change of Address

Please forward changes of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

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The issuance of this publication approved by the Secretary of the Navy on 28 June 1961.

The Armed Forces Institute of Pathology: 1862 - 1962

Colonel Frank M. Townsend USAF MC, Director, Armed Forces Institute of Pathology, Washington. Med Ann D. C. XXXI: 565-585, October 1962. *

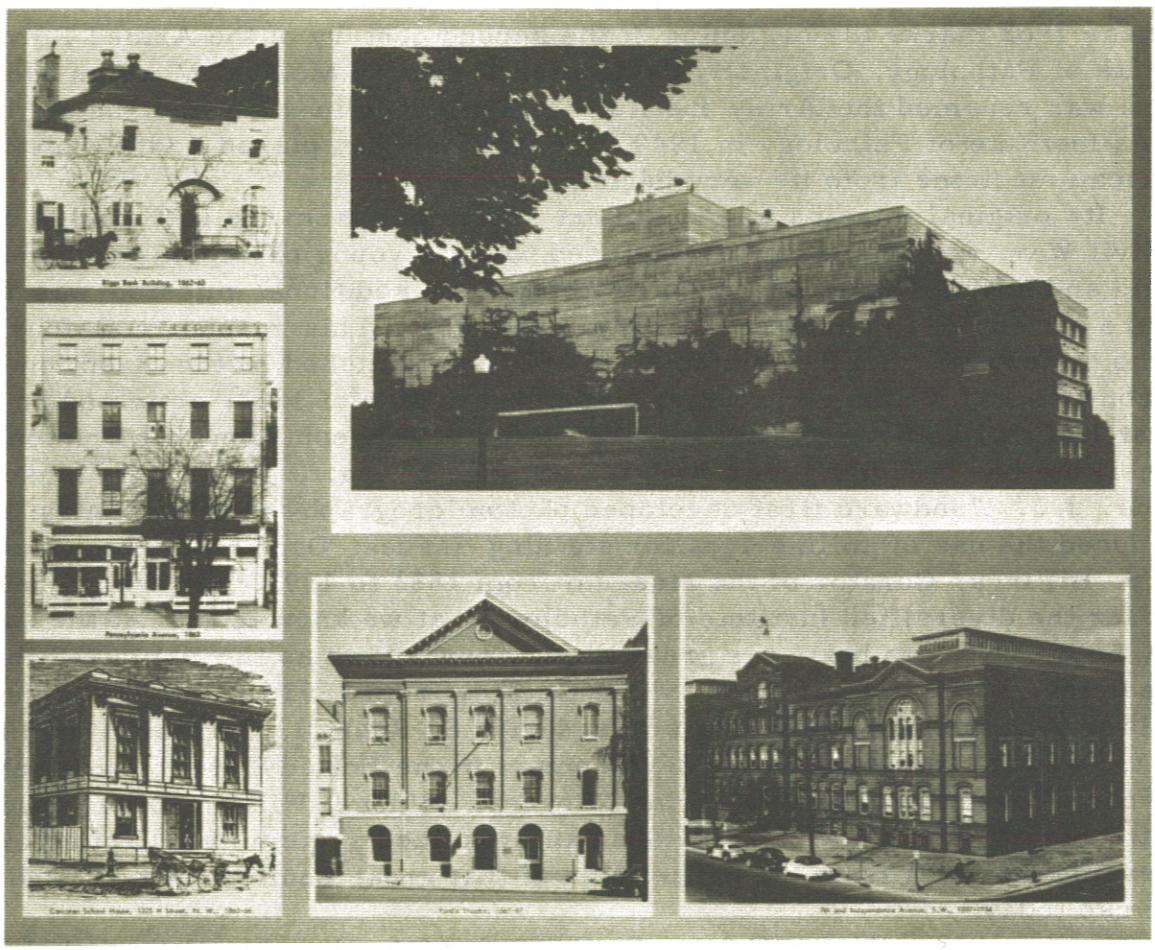
The year 1962 marks the beginning of the second century of the Armed Forces Institute of Pathology. Originally designated the Army Medical Museum which in turn was renamed the Army Institute of Pathology in 1945 and the Armed Forces Institute of Pathology in 1949, tne A. F. I. P has played a vital role in American medicine from its very beginnings.

Its original mission was to collect specimens from the battlefields of the Civil War, and this material was used to train young physicians assigned to field and hospital units of the Union Army. An additional mission was to prepare a medical and surgical history of the War. This monumental four-volume history was finally completed in 1888. Established by the direction of Surgeon General William Alexander Hammond in May of 1862, activated on August 1 of that same year under the direction of Surgeon John Hill Brinton, the Institute has steadily grown with the passage of years. It was at the Museum that Dr. J. J. Woodward first developed photomicrography in this country, and introduced the use of aniline dyes for staining tissues. Deputy Surgeon General John S. Billings, Curator of the Museum from 1883 to 1893, laid the groundwork for the diversified Institute of Pathology that we know today. At the same time, he brought into being the great library now known as the National Library of Medicine. Major Walter Reed, while Curator from 1893 to 1902, is famed for his work on yellow fever. Major Frederick S. Russell, Curator from 1907 to 1913, was instrumental in the development in the United States of vaccination for typhoid fever for use in the Armed Forces. Colonel William Otway Owen, Curator during World War I, developed an organized system of collecting and processing material from the battlefields of that great conflict that is still in basic use today.

In the 1920's, Major George R. Callender introduced modern pathology methods into the Museum and inaugurated the present system of registries. In 1930, these became the American Registry of Pathology, a joint enterprise between the AFIP and the National Research Council. Colonel James E. Ash, Curator during the period of World War II, was instrumental in the organization of the Institute along its present lines. Brigadier General Raymond O. Dart successfully terminated the long quest to secure adequate quarters which had begun back in the time of Colonel Owen; and, in 1955, the Institute occupied its present facilities which are located on the grounds of the Walter Reed Army Medical Center.

Previous homes of the Institute have been in the old Riggs Bank Building at 15th St., and Pennsylvania Ave., N. W., in 1862 - 1863; in a store building in the 1700 block of Pennsylvania Ave., later in 1863; at the Corcoran School House on H St., from 1863 to 1866; in Ford's Theater from 1866 to 1877; and in the old red brick building at Seventh St., and Independence Ave., S. W., from 1887 to 1955. The first three of these homes have long since disappeared. It is interesting to note, however, that the Columbian Medical

College (now the George Washington University School of Medicine) occupied the Corcoran School House when it was vacated by the Museum and still has facilities located on this site.



HOMES OF THE ARMED FORCES INSTITUTE OF PATHOLOGY

Upper right: Present home on the grounds of Walter Reed Army Medical Center, completed in 1955. Previous homes, beginning upper left, counterclockwise: Old Riggs Bank Building, 1862-63; store building in 1700 block of Pennsylvania Avenue, later in 1863; Corcoran School House, 1863-66; Ford's Theater, 1866-87; and building at Seventh Street and Independence Avenue, S. W., 1887-1955.

Museum activities of the Institute have continued in temporary buildings in the Mall area of downtown Washington. In this 100th year, and on the 21st of May, exactly one century after Hammond authorized the formation of the Medical Museum, the Museum has finally begun its move back into the old red brick building vacated by the National Library of Medicine which moved to new quarters in Bethesda, Md.

During its long history, the Institute has always been very much a part of the local medical scene. Throughout its life many members of its staff have

served on the faculties of the local medical schools. The Museum played host to the meeting of the American Medical Association held in Washington in 1868. Dr. James Woodward, who became President of the A. M. A., in 1882, was the first military medical officer to serve in this capacity. There are numerous interesting vignettes associated with the Museum-Institute during this past century. The founding meeting of the Cosmos Club was held in the Museum on December 13, 1878. The first roentgenogram taken in the city of Washington was made on the fourth floor of the Museum in 1896 only six months after Roentgen announced the development of the X ray. This early use of the X ray as a diagnostic instrument is vividly detailed in a personal communication from Joseph S. Wall, M. D., an "externe" of Garfield Memorial Hospital at that time. The admission record of the Hospital carries the dates, names, and diagnosis.

> "On June 10, 1896, a girl of 17 was admitted to the hospital because of a 0.22 calibre penetrating gunshot wound of the hip accidentally inflicted by her brother.
>
> It became my duty to accompany the patient in a horse-drawn ambulance to the Army Medical Museum to obtain the services of Dr. William Gray, then an official of the Museum, who was the only one in the city in possession of a Roentgen tube at that early date. After the orderly-driver and myself had struggled up four flights of stairs to Dr. Gray's laboratory carrying a rather plump young lady on the stretcher, she was exposed to the X ray for a period of one hour in order to secure a picture showing the location of the bullet.
>
> After this long seance of exposure to the beneficent rays, a satisfactory plate was secured, even though the tube was activated by a kind of static grindstone! The girl was taken back to the hospital where the bullet was successfully extracted by the attending surgeon, the late Dr. Arthur Snyder, aided by the X-ray findings."

The present-day Institute has a staff of over 600 and is engaged in the broad field of consultation, education, and research in pathology. Its staff publishes over 80 papers annually, and its research program consists of well over 200 separate projects. It is rapidly expanding its mission of geographic pathology, its staff members actively collecting material in the study of disease entities throughout the world. Today, it utilizes the technics of virology, biophysics, biochemistry, histochemistry, immunobiology, and anthropology as basic methodologies for consultation and research. It has a large and active veterinary division devoted to the study of diseases of animals, particularly those that affect our source of foodstuff or are transmissible to man.

The dental activities of the Institute date back to its beginnings. In 1895, the American Dental Association designated the Museum as its laboratory for interesting cases as well as material of historic importance. This was the forerunner of the present system of Registries of the American Registry of Pathology. The Registry of Dental and Oral Pathology is one of the twenty-six

Registries operated by the A. F. I. P. in conjunction with the national Research Council.

The Institute serves as one of the international reference centers for the study of the histologic definition of tumor types under the auspices of the World Health Organization. It is the home of the Joint Committee on Aviation Pathology which serves as a mechanism whereby pathologists of the military services of the United States, the United Kingdom, and Canada freely exchange information regarding the human factors in aircraft and missile accidents.

The Medical Illustration Service is unique in that—probably for the first time in history of medicine—all facets of this invaluable support activity have been gathered in one organization on a scale capable of meeting any requirement in the field of medical visual communications.

The Institute today is a truly "integrated" organization with personnel components of the Army, Navy, Air Force, Veterans Administration, and the Public Health Service, as well as a large civilian personnel component of the Defense Department (Army) and other Federal agencies. As a joint agency of the three military departments it is subject to the authority, direction, and control of the Secretary of Defense and is under the "management" control of the Secretary of the Army, with this authority vested in the Surgeon General of the Army. The Board of Governors of the Institute consists of the Surgeons General of the Army, Navy, and Air Force who are responsible for the day-to-day policy direction of the Institute on professional and related matters. The Director of the Institute is charged with responsibility for organization and effective operation of the Institute, including direction and supervision of its staff and activities.

The Department of Defense charter of the Armed Forces Institute of Pathology states that "the Director shall be a medical officer of the Army, Navy, or Air Force, selected on the basis of high professional qualifications in the fields of pathology and demonstrated medical administration ability." He is appointed for a period of four years, rotating in order among the Army, Navy, and Air Force. The first Director appointed under this charter was Brigadier General Elbert DeCoursey MC USA who served from 1950 to 1955. He was succeeded by Captain William M. Silliphant MC USN, 1955 to 1959. The present Director has served since 1959.

The Director is assisted by two Deputy Directors, one from each of the two military departments not represented by the Director. The present Deputy Directors are Colonel Joe M. Blumberg MC USA, and Captain Roger H. Fuller MC USN.

The Institute's organization consists of four major departments: the Department of Pathology, the American Registry of Pathology, the Medical Museum, and the Medical Illustration Service.

The Department of Pathology is comprised of nine major divisions covering such diverse areas as geographic pathology, military environmental pathology, basic sciences, dental, veterinary, and general and special pathology. Over two-thirds of the more than 600 individuals who make up the total staff of the Institute are assigned to the Department of Pathology. This is the

center of the Institute's consultation, research, and educational activities. The consultation service of the Institute is concerned with over 50,000 cases annually. Approximately 70% are surgical consultations from military, Veterans Administration, and other governmental agencies throughout the world. Under the aegis of the American Registry of Pathology, the Institute accepts cases for consultation from civilian pathologists. These augment the material from military sources, and together the collection of over 1,000,000 cases now on file make up the basis of the Institute's ever-growing educational program.

This latter activity consists of more than a dozen postgraduate short courses—usually of a week's duration—given throughout the year. Residency pathology training is available to military pathologists, and fellowships to both military personnel and civilians in all of the medical specialties. There are over thirty physicians and other professional personnel from an average of twenty foreign countries studying at the Institute at all times.

In addition to the educational activities carried on in the Institute, a wide variety of material is available for loan. This includes loan sets of microslides and lantern slides, gross tissues, films, and filmstrips. The staff of the Institute prepares numerous atlases and syllabi that accompany the loan material. Other educational material is available from the American Registry of Pathology. In the latter category are the fascicles of the Atlas of Tumor Pathology which are prepared under the auspices of the Division of Medical Sciences of the National Research Council, printed at the A. F. I. P., and sold by the American Registry of Pathology at the Institute.

The research activities of the Institute are extremely diverse. The methodologies include technics of histopathology, histochemistry, biochemistry, physical chemistry, biophysics, ultrastructure examination, the study of gross anatomic functional changes, coordination of clinical and pathologic study of cases, and biostatistics. The research program encompasses the medical and dental diseases not only of man but of animals. The current program consists of 240 different projects. In calendar year 1961, these activities resulted in 89 professional publications. The scope of the projects ranged from a study of the effects of cosmic rays on living animals in the stratosphere to mechanisms of utilizing biophysical means of identifying and determining the weight of chromosomes in cells.

From its humble beginnings, the Institute of Pathology has progressed and has reason to be proud of its growth and achievements over the past century. Along with fine medical schools, the many medical research institutes, and hospitals it has become a vital part of the great medical cneter that has come into being in the Nation's Capital today.

NOTE: The Staff of the U. S. Navy Medical News Letter adds its congratulations on this the one hundredth anniversary of the Armed Forces Institute of Pathology for its outstanding accomplishments and service to mankind.

* Official monthly publication of the Medical Society of the District of Columbia.

He'll Grow Out of It

Henry H. Work MD* - Editorial: Amer J Dis Child 104: 327-329, October 1962.

Recently, an observation of case material seen in a practice of child psychiatry has suggested that there is a rather serious and potentially damaging incubation period that exists in a variety of syndromes which eventually require psychiatric care. Initially, this period seems to relate to the delayed observations of parents concerning this behavior and their reluctance to admit it. This may be exaggerated by diagnostic and referral delays on the part of the physicians to whom the parents first take their children.

What impresses the psychiatrist when he sees such children is that symptomatology has been present over a period of time and in rather consistent amounts and yet the parents have often been reassured on the basis that he will "grow out of it." Psychiatric conditions in childhood rarely present themselves as emergencies or even as acute situations. More frequently, it is obvious that the pattern of behavior in many of these children has been constant over a period of time and that the difficulties which they demonstrate are discernible much earlier than would seem to be apparent in the actual referral.

There seem to be two factors involved in this situation. One concerns an appreciation of the process of growth; the other, reluctance on the part of physicians to see pathology in children and to do something about it at an early stage. Current studies of development consistently suggest that the process of growth is an ever building one. Children do not grow like flowers, blossoming out from within, but grow and develop in relationship to the outside world and particularly in relationship to other human beings. This is especially true of those with whom they have close contacts, such as their parents.

Furthermore, there are certain critical phases in this growth process: the need for security in the early years; the need for control as the child begins to grow; the need to understand his relationship with his peers of both sexes as he goes through early childhood; and the dramatic struggle of establishing himself and his identity in the adolescent period. In current psychiatric thought, there is less worry about the scars left by conflicts arising in these critical periods than about the manner in which such conflicts modify the child's approach to succeeding phases.

It is impressive in case histories to see how consistently children behave over periods of time, especially those who have gotten into conflicts early in life. An example of this is seen in the child who begins to rebel against controls that parents set, or one who has difficulty in establishing peer relations. Such difficulties become exaggerated as time passes, and each stage builds on the previous one in a rather orderly fashion. Thus it is that a rebellious adolescent may well have shown increased difficulties at the beginning of school and can often be recalled by the parents as one who was difficult to train in his earliest learning experiences which took place at home.

* Associate Professor, Dept of Psychiatry, School of Medicine, University of California Medical Center, Los Angeles 24, Calif.

The fact that these phenomena are both additive and cumulative is an important part of the developmental process and cannot be neglected. If one does not appreciate this cumulative process there may well be a reluctance to look at the ongoingness of these developing situations. Such an avoidance leads to the feeling that time itself will change and modify the personality of the child. Physicians interested in children naturally become allies of the child and, for this reason, are often rather indifferent to the anxieties of parents about the behavioral phenomena demonstrated by the children. It has been pointed out elsewhere that many physicians tend to exaggerate physical symptomatology of children and cause undue anxiety in parents because of their own natural interest in pathology. Equally, however, observation suggests that physicians tend to minimize behavioral difficulties and resort to a considerable amount of reassurance in order to make the difficulty go away as if by magic.

It is true that behavioral difficulties do not quickly respond to simple therapeutic measures. Further, looking to the core of the situation may lead the physician into conflict with the parent. One is impressed, however, with the amount of time taken by physicians in trying to "rule out" various possible causes of a behavioral symptom. No expense or time is to be spared if a child complains of abdominal pain. Even at the end of such a search, functional disorder is usually diagnosed by exclusion. This reluctance to make a positive diagnosis of an emotional disorder only prolongs and aggravates the symptoms. Yet the physician is comforted and feels that he has done his task well.

There are certain hints, however, which would suggest a concern for behavioral difficulties as warranting some investigation. One of these is the number of complaints that a parent makes about a child. Elsewhere, studies have shown that a parent who makes a large number of behavioral complaints about a child is demonstrating with good correlation the amount and intensity of the difficulty. Second, there is the consistency of behavioral patterns. A child who actively rebels during infancy and early years and continues to do so up to the early years of school is quite likely to be in need of help. Whenever one sees this pattern there is indication to intercede. Third, is the manner in which the parent tells about the difficulty. If the description of the child is full of references to the child's bad behavior and its impact on the parent, there is every evidence that a serious conflict exists and the situation warrants looking into. Contrariwise, one occasionally sees parents who are extremely bland in their presentation of symptoms which would bother outside observers excessively. Such bland denial suggests a rather complete ignorance of normal behavioral characteristics of children. Lack of affect on the part of the parent should make the physician more alert to examine the child and to discover what is his customary behavior.

Reassurance is one of the most powerful and ancient tools of the physician. Unfortunately, parental concern related to a phase of growth may too often be met with reassurance. Application of this powerful tool at times may alleviate symptoms. These same symptoms may well go underground if the basic conflict is not understood and removed. They may equally well reappear

in the next developmental phase. A retrospective view of emotional disorders of adults suggests an everlasting building during phases of maturation. Whenever the physician sees an excessive number of symptoms developing in a child, or modifications of the developmental process, he must be alert to continue a cumulative sort of observation. Just as the knowledge of development has come out of increased interest in the dynamics of the progress of growth, so increased diagnostic and prognostic skill will arise, not from a dismissal of symptoms, not from an assumption that certain states of behavior are encapsulated and different in themselves, but rather from an understanding that behavioral difficulties at any period in growth have a cumulative effect and continue to expand just as the organism itself grows.

It is reasonable to be an ally of a child, but children are neither loaded with original sin nor continually "trailing clouds of glory." The entire range of adult behavioral pathology can be demonstrated in children and it is possible that were more attention paid to it earlier, less adult pathology—with which someone must deal—would be present.

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A Case of Phenobarbital Poisoning

NOTE: Submitted by Brigadier General Abolfazi Moghbel, Surgeon General, Imperial Iranian Navy, Tehran, Iran, to Rear Admiral C. B. Galloway MC USN, Assistant Chief of the Bureau of Medicine and Surgery for Research and Military Medical Specialties. The case was reported to General Moghbel by Brigadier General A. Y. Parmoon (M. D.), Commanding Officer of Army Hospital No. 2, Tehran—where the patient was hospitalized and treated. General Moghbel and General Parmoon both expressed appreciation for regular receipt of the U. S. Navy Medical News Letter. They made reference to Vol. 37, No. 12 of 23 June 1961 which contained an abstract of an article on "Barbiturate Poisoning." They stated that the abstract "was of valuable help in giving the latest data concerning this type of intoxication," and was utilized as a guide to therapy of the case reported. The original of the article was entitled "Therapeutic Trends in the Treatment of Barbiturate Poisoning: the Scandinavian Method," by Carl Clemmesen, Psychiatric Department, Bispebjergs Hospital, Copenhagen, Denmark, and Eric Nilsson, University Hospital, Lund, Sweden, in Clin Pharmacol Ther 2: 220-229, March - April 1961.

Appreciation is extended to Brigadier General Abolfazi Moghbel and Brigadier General A. Y. Parmoon M. D., for making it possible for the Medical News Letter to publish this interesting report. —Editor

Case Report

"Mr. H. T., age 30, was admitted to No. 2 Army Hospital in Tehran on May 6, 1962. On admission the patient was in deep coma, all reflexes were abolished, there was no cyanosis. Blood pressure 120/70 mm, pulse 62, respiration 20;

there was no abnormal odor of the breath. Immediate treatment consisted of oxygen given through a nasal catheter, endotracheal aspiration, partial exchange blood transfusion, some central analeptics, intravenous perfusion of proteins, and back care to prevent bed sores.

During the second hospital day, the patient went into peripheral circulatory collapse (shock) with temperature 40 C. To combat shock we used: Desoxycorticosterone, I. V. fluids (dextrose with analeptics), oxygen through endotracheal tube, and tracheal aspiration. These measures were effective in bringing the patient out of shock.

Third hospital day: intravenous injections of dextrose solution and normal saline (total of 3 liters per day), with vitamin C 500 mg in I. V. solution, and crystalline penicillin 400,000 units every 3 hours were administered. Oxygen given through a free airway, continuous aspiration of tracheal secretions, ice bags on head and legs to bring the temperature down, and indwelling catheter were other measures used.

Fourth hospital day: the patient was still under close medical care but with no marked improvement. A few extrasystoles and arrhythmias were encountered. An attempt was made to correct the patient's acidosis by giving 500 cc 1/6 Molar Lactate and I. V. Cortisone. He developed tachycardia of 160/min with blood pressure 110/60.

Because of difficulty in respiration and since it was felt that the patient would be in coma for some time, a tracheostomy was performed on the 5th hospital day. Intravenous fluids and an indwelling catheter were continued.

Sixth hospital day: the patient was still in coma. However, his general condition had improved slightly. Reaction of the eyes to light had returned. He was still an intensive nursing and medical care problem.

Seventh hospital day: the patient became conscious, all reflexes returned and were normal; temperature dropped to normal; blood pressure was 110/60, pulse 100. He then admitted that he had taken 60 tablets of Phenobarbital of 100 mg each, a total dose of 6 Grams.

Eighth hospital day: the general condition of the patient was satisfactory. He was placed on a liquid diet which was gradually shifted to regular. The tracheostomy tube had been removed on the 6th day. The patient was discharged in a fully recovered state after 20 days of hospitalization."

General Moghbel comments that "this type of case is very rare in Iran, but in the case of this patient, he had attempted suicide by taking 60 luminal tablets (100 mg each)." A follow-up report by General Parmoon to General Moghbel indicated that the patient was doing very well after discharge from the No. 2 Army Hospital, Tehran.

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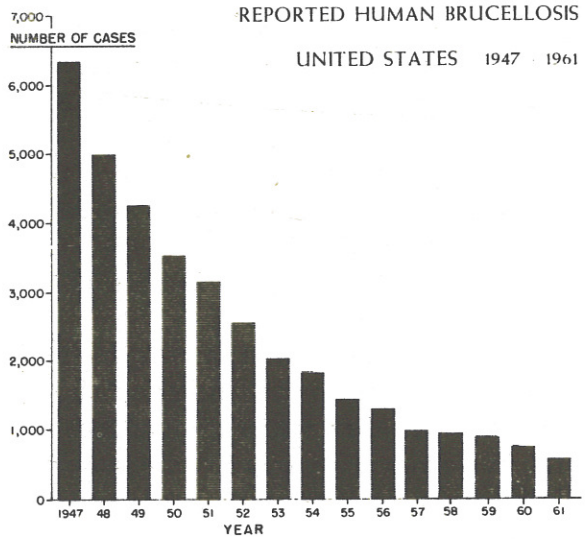
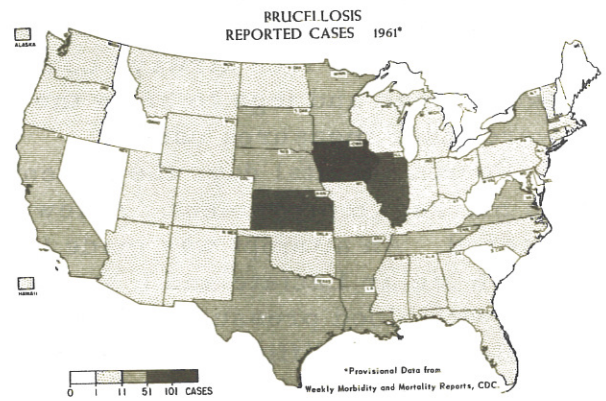
Human Brucellosis in the United States - 1961

Morbidity and Mortality Weekly Report, Dept of HEW, Public Health Service, August 24, 1962.

The 580 cases of human brucellosis reported to the Communicable Disease Center during 1961 continue the progressive decline in cases which has occurred since 1948, as shown in the accompanying graph. Individual case histories were received on 413 cases.





The geographic distribution of human brucellosis has shown the highest concentration since 1958 in the upper midwestern area (See map). In 1961, Iowa reported the greatest number of cases, 219, followed by Illinois with 61 cases and Kansas with 54. In the North and West, most cases occurred among packing house workers and butchers, while a majority of cases in the South were related to persons handling infected animals and to the ingestion of milk products from diseased animals.

The National Brucellosis Eradication Program has made marked progress in recent years in control of bovine brucellosis; however, the control

TABLE I

HUMAN BRUCELLOSIS CASES BY PROBABLE SOURCE OF INFECTION, 1961

Swine	122
Cattle	70
Cattle and swine	52
Sheep or Goat	1
Packing House	41
Rendering Plant	2
Raw Milk	34
Vaccine Accidents	9
Others	7
Not stated	75
Total	413

TABLE II

HUMAN BRUCELLOSIS CASES BY OCCUPATION, 1961

Packing House	174
Rendering Plant	4
Stock Yard	3
Farm Workers	80
Wives and Children	53
Professionals	23
Others or Not Stated	76
Total	413

and eradication of brucellosis in swine has been less successful. The source of infection for the 413 cases on which this information is available (Table I) shows that swine-associated cases now account for almost one-half of the infections. The occupations of persons having brucellosis are shown in Table II. Packing house workers accounted for the largest number of cases, 174, while farm workers constituted the next most vulnerable group.

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MISCELLANY

Medical Service Corps Notices

Part-Time Outservice Training (Ref: BuMedInst 1500. 7). Concerted efforts are being made to upgrade the educational level of all officers in the Naval Service. In keeping with this objective, more than 100 Medical Service Corps officers are currently enrolled in part-time outservice training under BuMed sponsorship. Several more are enrolled under other programs. This is a significant increase in enrollment when compared to the eighteen enrolled in the Fall Semester 1958. Requests for tuition assistance should reach the Bureau as soon as the curriculum is known so that unnecessary delay in enrollment will not be encountered.

Full-Time Training (Ref: BuMedInst 1520. 12A). Medical Service Corps officers with 2302 or 2305 designators who desire to be considered for assignment to the Naval School of Hospital Administration or Sanitary Science course at the University of California must submit individual requests. Requests for 1963 Naval School of Hospital Administration class must reach this Bureau prior to 1 February 1963. Requests for next Sanitary Science course must reach the Bureau of Medicine and Surgery prior to 1 July 1963.

—Medical Service Corps Division, BuMed

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Medical Aspects of Diving - A New Film

If you are in any way concerned with diving and underwater swimming, whether in their military application or as an increasingly popular sport, you will be interested in a new two-part Navy film released by the Bureau of Medicine and Surgery under the general title "Medical Aspects of Diving" (MN-8749). Part I, "The Mechanical Effects of Pressure" (MN-8749a) explains how underwater

swimmers and divers can avoid harm to themselves by preventing unequal pressures from the air they breathe and the water that surrounds them. In one-half hour of running time, this part of the film covers a number of matters of great practical interest: the properties of gases and liquids pertinent to problems of diving; relationship between gage pressures and absolute pressures; relationship between water depth, air volume, and pressure (Boyle's Law); the harmful effects of pneumothorax, emphysema, air embolism, and the various squeezes which range from congestion of the sinuses to crushing of the entire body. Animation is used to explain the mechanisms that cause these conditions, and live photography of both real and simulated cases shows their effects.

Part II, "Effects of Elevated Partial Pressures of Gases" (MN-8749b), explains how the body is affected by what you breathe and the pressure at which you breathe it. This second part runs slightly less than one-half hour. It is concerned with physical laws applying to partial pressures of gases, specifically as these laws are pertinent to problems of deep-sea diving and underwater swimming. It explains how the partial pressures of gases of which air is composed affect interchange of these gases in the capillary beds of the lungs and other parts of the body, how partial pressures can be altered, and their effect on the body's gaseous equilibrium. Part II explains and demonstrates causes and symptoms of nitrogen narcosis, decompression sickness, oxygen toxicity, anoxia, and carbon dioxide poisoning. Animation is used to make clear the concept of partial pressure and to explain the mechanisms that cause decompression sickness and anoxia; live photography of actual and simulated cases demonstrates the various phenomena discussed.

Viewers of "Medical Aspects of Diving" may be interested in a behind-the-scenes anecdote. The technical advisor wanted a life-size demonstration of the physical fact that atmospheric pressure exerts a force sufficient to support a 33-foot column of sea water. The law is demonstrable in the laboratory with a small column of mercury, but mercury is not the medium in which swimmers and divers operate; the technical advisor wanted realism. He had a tube of semi-rigid plastic of one-inch inside diameter hoisted into position for photography aboard the ASR assigned to assist in production; sailors filled the tube with water from the top while others held a bucket of water at the bottom; then the top was sealed. The demonstration almost worked: the water sought the expected level—then the ship began to roll, not much, just a little—the tube began to undulate. Once this started, there was no stopping it; the tube waved rhythmically, its column of water squirted out rhythmically, everybody got wet, and almost everybody laughed.

Undefeated and still committed to his idea, the technical advisor took his production crew ashore. There he had another tube—of rigid plastic this time—secured to the sideof the Experimental Diving Unit building in Washington. The demonstration worked, the footage was shot. "Medical Aspects of Diving" offers visible proof that the air around us will support a tall column of water.

Prints of the film have been distributed to District libraries and to the numerous special Navy units engaged in underwater training. If prints are not available from your usual source, address inquiry to Commanding Officer (Film Distribution Division), Naval Photographic Center, Naval Station, Anacostia, Washington 25, D. C. —From Audio-Visual Training Branch, BuMed.

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National Research Council Committee Meets at NAMRU-4. The twentieth meeting of the Committee on Naval Medical Research of the National Research Council, National Academy of Sciences, met at NAMRU-4 and at the Dental Research Facility on 8 and 9 October 1962. Twenty-eight military and civilian physicians and scientists attended the two-day meeting to discuss the research program being conducted at Naval Medical Research Unit No. 4 and the Dental Research Facility. Current problems, progress made to date, and long range planning were considered by the Committee. CAPT Lloyd F. Miller MC USN is the Officer in Charge of NAMRU-4, U. S. Naval Hospital, Great Lakes, Ill. CAPT Gerald L. Parke DC USN is the OinC, Dental Research Facility.

Streptococcal Seminar. The Sixth Annual Seminar on Prophylaxis of Streptococcal Infections in the Armed Forces was conducted at NAMRU-4 on 1 and 2 October 1962. Army, Navy, and Air Force officers and civilian scientists participated in the two-day meeting. Prevention of acute rheumatic fever which is contingent upon prevention and early treatment of streptococcal infections was the principal topic discussed. The prophylactic program developed and tested at Great Lakes has been over 90% effective.

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U. S. Navy Finance Center Observes 20th Anniversary in Cleveland, Ohio

When a Navy man "takes out" an allotment, requesting that a certain sum of money be deducted from his pay and sent to his family, to his insurance company, or to other designated persons or organizations, he uses the Navy's "bank." Perhaps he isn't aware of the size and scope of the "bank" or that its 17 officers, 20 enlisted personnel, and 868 civilian workers are extremely conscious of the contribution which their services make to his morale. Some may not know where the bank is located.

To many Navy men it will come as a surprise to learn that the "bank", the Navy Finance Center, has been located in Cleveland, Ohio since 1942. The Finance Center—beginning October 1962—is observing the 20th anniversary of its relocation from Washington, D. C. Actually, events leading to the move to Cleveland occurred during the early days of World War II. The smoldering ships at Pearl Harbor hadn't cooled off before it became apparent that Washington with its high concentration of military offices, presented an inviting target. President Roosevelt called for decentralization of certain activities from the

Washington area. In accordance with this plan, the Paymaster General of the Navy trimmed four divisions from the Bureau of Supplies and Accounts and relocated them as a field branch.

LCDR Walter Honaker—later Rear Admiral Honaker—and Mr. Norwood P. Cassidy of the Comptroller's Office, were assigned the Herculean task of finding a suitable location and transferring the four divisions. Cleveland was chosen for reasons of location, facilities, and potential manpower. Then LCDR Honaker and Mr. Cassidy began the task of disassembling the intricate financial mechanism and reassembling it 350 miles away without interrupting the vital flow of operations. In Cleveland, efforts were made to locate living quarters for civilian workers and military from Washington and to recruit clerical and secretarial help locally. By the end of the first week, 150 persons had been hired, and by December the figure reached 300.

Meantime, in Washington 450 civilian workers and 370 military were preparing to make the weekend journey to Cleveland. Equipment and records were readied for shipment, requiring in all, three freight cars and 53 moving vans.

At Pittsburgh, officials of Cleveland's Hollenden Hotel gave the contingent from Washington an advance welcome and presented them with keys to their hotel rooms. The welcome was further amplified by a brass band and official greeters upon their arrival at the hotel.

By Monday morning, the transferred employees were at their desks in the new office with the unfinished work ready for them to pick up where they had left off in Washington. They hadn't missed a step and there was no delay whatsoever in issuing checks.

Once established, the Field Branch grew steadily; by 1945, it had reached its peak of more than 4000 persons of whom about two-thirds were military personnel. The offices had spread into two additional buildings and two hotels were converted to WAVE Barracks.

With the end of the war, thousands of Navy men returned to civilian life and the Field Branch began to shrink. By 1950, there were a little over 1000 persons on board—most of whom were civilians.

In 1950, with the outbreak of the Korean Conflict, the Center again expanded, but this time with quiet efficiency, then contracted as the emergency subsided. Early in 1955, the name was changed from Field Branch, Bureau of Supplies and Accounts, to the U. S. Navy Finance Center with responsibility directly to the Comptroller of the Navy. Since the Korean Conflict, the Finance Center has refined its methods and systems steadily to achieve greater economy and efficiency. Its conversion from clerical-EAM equipment to electronic data processing has been considered one of the best planned and smoothest conversions known. Transfer of more than one million records was carried out without a hitch or delay in mailing checks, and the new system has resulted in an annual saving of more than $150,000.

The mission of the Finance Center is essentially the same as in 1942—providing financial services to Navy personnel scattered around the globe, including payment of allotments and Fleet Reserve and retired pay. Additional

functions now include auditing ship and commissary store returns and financial returns from ship and overseas activities, payment of annuities to beneficiaries of deceased retired personnel, settlement of claims, and collection of over-payments. This adds up to a billion and a half dollars worth of business each year, making the Navy Finance Center one of Cleveland's larger "industries."

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American Board Actions

Certification by American Board of Ophthalmology

LCDR Gerald D. Faulkner MC USN

Certification by American Board of Surgery

LCDR Fred R. Walton MC USN

The following officers have successfully passed the Part I examinations of:

American Board of Anesthesiology

LT Allyn E. Gilbert MC USN
LT Alan L. Heck MC USN
LT Donald M. Kinkel MC USN
LT Harry S. Pollard Jr, MC USN
LT Irving V. Wright MC USN

American Board of Orthopaedic Surgery

LCDR Don K. Gilchrist MC USN
LT Kenneth F. Spence MC USN

Correction: In the Medical News Letter of 5 October 1962, Vol. 40, No. 7, page 17, notice of certification of CDR Richard L. Davis MC USN by the American Board of Surgery was erroneously reported. This certification was received by CDR Robert L. Davis MC USN.

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Naval Medical Research Reports

U. S. Naval Medical Research Institute, NNMC, Bethesda, Md.

1. The Small Intestine in Acute Radiation Death in the Dog: MR 005.08-1300.08 Report No. 2, December 1961.
2. Chemical Structure of the Periodontium: MR 005.12-5000.02 Report No. 6, January - February 1962.
3. Incorporation of Palmitate-1-C^{14} into Neutral Lipid of Rat Diaphragm: MR 005.12-1100.02 Report No. 14, April 1962.
4. A Device for Adapting the Rotary Microtome to Frozen Sectioning: MR 005.08-1300.03 Report No. 10, May 1962.

5. Studies of the Possible Cariostatic Effect of Sodium Molybdate: MR 005. 12-5000. 02 Report No. 7, May - June 1962.
6. Local Membrane Current in Outer Segments of Squid Photoreceptors: MR 005. 03-1001. 03 Report No. 2, June 1962.
7. Navy Psychiatric Assessment Program in the Antarctic: MR 005. 12-2003. 01 Report No. 1, August 1962.

U. S. Naval Medical Research Unit No. 4, U. S. Naval Training Center, Great Lakes, Ill.

1. Method for Fractionation of Gamma Globulin Studies on Serum and Synovial Fluid: MR 005. 12-1102, July 1962.
2. Physiochemical Study and Effects of Treatment on a Cold Precipitant Protein and Other Serum Constituents from a Patient with Multiple Myeloma: MR 005. 12-1102, July 1962.

U. S. Naval School of Aviation Medicine, Aviation Medical Center, Pensacola, Fla.

1. Some Observations on the Behavior of a Visual Target and a Visual After-Image During Parabolic Flight Maneuvers: MR 005. 13-6001 Subtask 1 Report No. 64, June 1962.

(to be continued)

IN MEMORIAM

RADM Emil J. Stelter MC USN (Ret)	23 August 1962
CAPT Byron F. Brown MC USN (Ret)	30 September 1962
CAPT Morris C. Craig DC USN	25 June 1962
CAPT Oscar Davis MC USN (Ret)	31 May 1962
CAPT George F. Freeman MC USN (Ret)	9 August 1962
CAPT Albert J. Geiger MC USN (Ret)	26 May 1962
CAPT Vinton Hall MC USN	17 October 1962
CAPT Robert E. S. Kelley MC USN (Ret)	15 August 1962
CAPT Earl Richison MC USN (Ret)	2 July 1962
CAPT Edwards M. Riley MC USN (Ret)	4 October 1962
CAPT John C. Traugh MC USN (Ret)	2 August 1962
CAPT Robert D. Wyckoff DC USN	9 October 1962
CDR Joseph D. Halleck DC USN (Ret)	20 July 1962
LCDR Arvin L. Maines MSC USN (Ret)	10 June 1962
LCDR Otis A. Peterson DC USN (Ret)	13 June 1962
LT Ezra J. Cooley MSC USN (Ret)	17 October 1962
LT Mabel G. Harrison NC USN (Ret)	8 October 1962
LT Chester O. Kimball MSC USN (Ret)	20 September 1962
LTJG Robin E. Reed MSC USN (Ret)	19 October 1962
ENS Ada E. Griffith NC USN	9 May 1962

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SECURITY QUIZ

WHAT'S YOUR SECURITY SCORE?

1. If you locked the safe or cabinet, did you spin the dial four turns in each direction after closing and testing each drawer?
2. Did you make sure that your desk or working area was protected at lunch time?
3. Did you cover or put away classified material when any unauthorized person stood near your working area (this includes persons in your own area who have no need to know)?
4. Did you write any classified notes, combinations, or try out any classified stamps on calendar pads, desk blotters, document covers, or other unauthorized places?
5. Did you leave the receiver off the hook unguarded while classified information was discussed within 25 feet of the telephone?
6. Did you leave any notebook, manual, or study guide containing classified material where others might read them?
7. Have you carried your safe combination in your purse, billfold, pocket, or shoe?
8. Have you refrained from "talking shop" in the barracks, in the car pool, going home, on the bus, or in any place in town?
9. Have you taken any classified material to your home or to your barracks without express permission from your supervisor?
10. Have you helped to spread dissatisfaction, rumor, fear, or lack of faith in our country?

BONUS QUESTION: With your conscience as your guide, have you answered the preceding 10 questions honestly?

ANSWERS TO SECURITY QUIZ

1. Yes
2. Yes
3. Yes
4. No
5. No
6. No
7. No
8. Yes
9. No
10. No

(Naval Training Bulletin (NavPers 14900), Bureau of Naval Personnel, Summer - Fall 1962)

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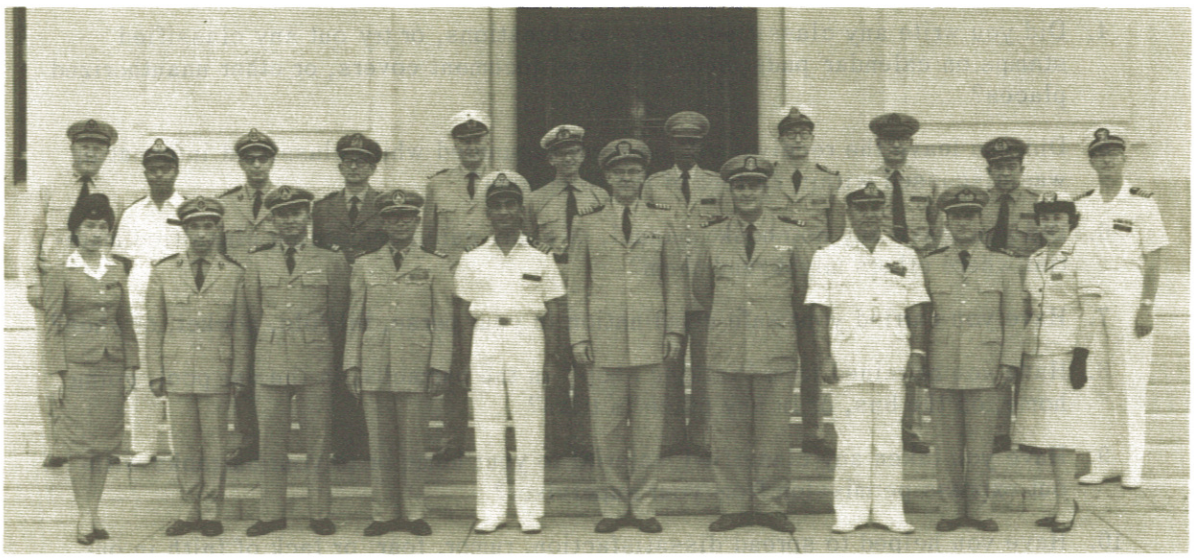
FROM THE NOTE BOOK

The President's People to People Program at Work

On 6 September 1962, RADM R. B. Brown MC USN, Commanding Officer, NNMC; CAPT P. F. Dickens Jr, MC USN, Commanding Officer, U. S. Naval Medical School; and the Commanding Officers of the NNMC component commands officially welcomed seventeen Medical Officers and one nurse from twelve foreign countries.



FOREIGN MILITARY MEDICAL OFFICERS TRAINING PROGRAM
U. S. NAVAL MEDICAL SCHOOL
NATIONAL NAVAL MEDICAL CENTER
BETHESDA 14, MARYLAND
1962

FIRST ROW: ENSIGN PUREZA T. TOLEDO NC (PHILIPPINES); LIEUTENANT COMMANDER J. ROODGARMI MC (IRAN); LIEUTENANT REYNALDO JIMENEZ MC (PHILIPPINES); COMMANDER BENITO GONGON MC (PHILIPPINES); SURGEON COMMANDER S. D. I. HEREKAR MC (PAKISTAN); CAPTAIN P. F. DICKENS, JR. MC USN COMMANDING OFFICER, U. S. NAVAL MEDICAL SCHOOL; LIEUTENANT MANUEL de J. MANON MC (DOMINICAN REPUBLIC); SURGEON COMMODORE S. H. A. GARDEZI MC (PAKISTAN); LIEUTENANT CARLOS E. RIVERO MC (VENEZUELA); LIEUTENANT COMMANDER NORMA R. COYLE NC USN

SECOND ROW: CAPTAIN CHEN-YING LI MC (CHINA); SURGEON COMMANDER R. A. RIYAZ MC (PAKISTAN); LIEUTENANT ASGHAR TARASSOLI MC (IRAN); CAPTAIN PAULO de A. LEAO MC (BRAZIL); COMMANDER HORST ROBBERS MC (GERMANY); LIEUTENANT COLONEL PAULO D'ERRICO MC (ITALY) LIEUTENANT EMMANUEL GILLES MC (HAITI); COMMANDER SEVALD BERTELSEN MC (NORWAY); LIEUTENANT COMMANDER SZE-MING SHEN MC (CHINA); LIEUTENANT COLONEL AMIR KASIM MC (INDONESIA); CAPTAIN JOHN M. HIRST MSC USN COURSE DIRECTOR, U.S. NAVAL MEDICAL SCHOOL

The occasion marked the beginning of the ten-week courses in Naval Medical Management and Naval Preventive Medicine for foreign Medical Officers and Naval Orientation for foreign military nurses conducted annually by the Naval Medical School under the direction of CAPT J. M. Hirst MSC USN. This marks the sixth consecutive year that these courses have been conducted at the NAVMEDSCOL, the first having been under the direction of RADM C. B. Galloway MC USN, in 1957.

The course, as part of the President's People-to-People Program, renders it possible for officers of other countries to become familiar with certain aspects of the U. S. Navy in general and the Medical Department in particular. It is also instrumental in acquainting them with our country and its people and vice versa. To accomplish this, an interesting itinerary was arranged for the students to visit military installations and other points of interest at: Boston, Mass., New London, Conn., Detroit, Mich., Philadelphia, Penna., Annapolis, Md., New York, N. Y., Pensacola, Fla., and Pittsburgh, Penna.

The course, the theme of which is "Global Military Medicine," will terminate on 16 November after all participants in these courses have had an opportunity to attend the Annual Meeting of the Association of Military Surgeons of the United States at the Mayflower Hotel, Washington, D. C., 12-14 November 1962.

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IMPORTANT ANNOUNCEMENT ON IMMUNIZATIONS

1. BUMED INSTRUCTION 6230.1C, Subj: Immunization Requirements and Procedures, of 5 Sep 1962.

This Instruction incorporates into the Navy Directives System a revised joint Army-Navy-Air Force directive concerning immunization requirements and procedures to be followed in carrying out the immunization program of the Navy.

Major changes are that typhus and yellow fever immunizations have been added to the routine inoculations for military personnel, oral attenuated poliomyelitis vaccine has replaced inactivated vaccine, and that the basic series of typhus has been reduced to a single injection. The booster dose of tetanus toxoid has been reduced to 0.1 ml.

BUMED NOTICE 6230, same subject, now in process, provides additional information concerning military dependents and civilian employees in that cholera, typhus or yellow fever vaccines need not be given unless required in the geographical area to be visited.

2. BUMED NOTICE 6230, Subj: Influenza vaccination program, of 20 Sep 1962.

Since the requirements for carrying out the influenza vaccination program have been included for the first time in the above Instruction (6230.1C) as a routine procedure, this Notice supplements information concerning personnel to be immunized, time of administration, dosages, and procurement of influenza vaccine. Additional information to follow in the 7 Dec 1962 issue of the Navy Medical News Letter. (PrevMedDiv, BuMed)

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ERRATUM NOTICE: Vol. 40, No. 9, page 36, 2 Nov 1962.
Know Your World - Plague, Other Lessons: para 1, line 4; change to read, "1 gram sulfadiazine 4 times daily." Add: "Plague prophylaxis may consist of 1-2 grams sulfadiazine per day.

DENTAL SECTION

Current Dental Problems in Archaeology

E. K. Tratman, University of Bristol. Presented at the Second Meeting of the Bone and Tooth Society of Great Britain at the Engineering School, University of Bristol, on 28 March 1962.

A perennial archaeological problem concerns the estimation of age of an individual at the time of death. Different conclusions may be reached by the anatomist and the dentist, but it is submitted that the state of the teeth provides a more accurate guide to age, between babyhood and about 30 years, than does the state of the sutures of the bones.

Tooth cleaning habits produce abrasion facets on the teeth. Elaborate tooth cleaning rituals are practiced by primitives, yet abrasion defects are rarely noted as occurring in prehistoric material in Britain. However, a jaw dated as Bronze Age (c. 1400 B. C.) had in it a tooth which clearly showed not only that a toothpick had been regularly used, but also that an unsuccessful attempt at extraction had been made. Several teeth discovered at the Late Upper Palaeolithic site of Aveline's Hole, show marks suggesting that toothpicks had been regularly used.

Deliberate mutilation of the teeth is a well-known practice among present-day primitives, and is sometimes related to initiation ceremonies. Recently a maxilla from a site claimed by the excavator to be of Mesolithic or Early Neolithic date (c. 4500 B. C.) showed that the anterior teeth had all been filed down at about the age of 18-20 years. This specimen was from a male. Evidence of similar mutilation in other male skulls at about the same age, but not in those of females, would suggest a connection with the initiation of youths into the community.

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Experimental Evaluation of Operative Wound Irrigation

Frederic W. Taylor, Indianapolis Veterans Hospital, Indianapolis, Ind. Surg Gynec Obst 113:465-470, Oct. 1961. Dental Abstracts 7(8):488, Aug. 1962.

Opinion varies as to the value of wound irrigation during surgical closure. This study was undertaken to evaluate wound irrigation experimentally. The usual bacterial count on Petri dishes placed in the operative field in the author's operating rooms is slightly under 40 colonies per hour.

In carrying out the washing of the wound, the operator placed 5 ml of sterile saline solution in the subcutaneous trough of the wound at completion of the operation after fascial closure. Double this amount was used in large wounds. The solution was agitated back and forth with the operator's finger in the subcutaneous fat for 30 seconds. The wash solution then was placed in the first sample test tube. This washing process was repeated a second and, occasionally, a third time. One milliliter of the samples of the various washings was immediately layered on the surface of a fresh dextrose agar plate and a colony count was made after 48 hours' growth. From this count was calculated the number of bacteria removed by the wash water.

From the washings of 165 clean wounds, 412 cultures were made. Another 100 washings were cultured from contaminated wounds.

There was an average estimated airborne contamination of 60.5 bacteria in each of the 165 clean wounds. These proved to be hemolytic and nonhemolytic staphylococcus and streptococcus and a few tetrads. An average of 103 bacteria were removed with the first wound washing, 97.4 with the second and 70 with the third.

It is not known why several times as many bacteria were washed from a wound as are known to have fallen into it. Several explanations seem logical; there is the added skin contamination; additional bacteria undoubtedly are carried into the wound by gloves and instruments, and bacteria multiply in the wound at a rate that can only be guessed. The miracle is that the average wound heals so well although it may harbor hundreds and even thousands of pathogenic bacteria.

Primary wound healing depends on many variable factors. Within limits, the least important of these is the number of bacteria in the wounds. The usual wound irrigation is a very inefficient means of removing bacteria unless the wound is grossly and heavily contaminated. The irrigations may force bacteria into deeper crevices hitherto not infected.

The most important benefit derived from irrigation of the usual clean wound is the removal of fat, detritus and blood clots which might act as a foreign body nidus encouraging bacterial growth. Removal of this possibility is worth the effort.

One-fifth of "clean" wound washings contained an exceptionally heavy contamination. A check indicated that 30% of the surgeons found holes in their gloves at the conclusion of the operation. More attention should be given to this source of contamination.

Washings from the wound of the usual bowel or gastric resection indicated few more bacteria in the wash water than in the clean wound group.

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Newly Standardized Dental Item.

FSN	Nomenclature	Unit Issue	Unit Price
6520-823-7845	Evacuator, Oral Cavity, Dental, 110 Volts, 60 Cycle, AC	Ea.	150.00

Distinction Between Disease and Disorder

Ashley Montagu, Cherry Hill Road, Princeton, N. J. JAMA 179:826, March 10, 1962. Dental Abstracts 7(8):498, August 1962.

Disease is a morbid change in any tissue or tissues of an organism, or in an organism as a whole, often caused by specific microorganisms producing characteristic symptoms.

Disorder is a disturbance of structure or function or both due to a genetic or embryological failure in development or as the result of exogenous factors, such as certain chemical substances, injury or disease. It may be inborn or acquired.

Disease is limited to malfunctioning of the organism initiated and maintained by infectious process. A disorder may or may not be initiated by an infectious process, but, however initiated, the malfunctioning is not maintained by an infectious process. A disorder may be the result of an infectious process, remaining long after the infection has ceased. A disorder may also be the result of a noninfectious process, such as an inborn error of metabolism due to some enzymatic deficiency or to a chromosomal abnormality. In this class of conditions the disorder is maintained by a noninfectious derangement of chemical conditions. Diabetes mellitus, for instance, is a disorder, not a disease, because it is neither initiated nor maintained by an infectious process but by a physiological failure of the pancreas.

It becomes increasingly necessary to distinguish sharply and clearly between malfunction and maldevelopment due to hereditary conditions, chromosomal abnormalities, infections, and environmental conditions. Each of these distinctions should be recognized in describing any condition of the organism in which they are involved.

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Personnel and Professional Notes

Beneficial Suggestions Approved by the VA. The following selected suggestions submitted in accordance with the Veterans Administration's Incentive Awards Program have been approved by the VA as having potential application at their field stations. Further information concerning these suggestions may be obtained by communicating directly with the originators.

"Use of Electrode Jelly in Testing Teeth With Electric Pulp Testor"

Employee Suggestion No. 5214-S-232

(Submitted by Robert E. Crowley, DDS, Chief, Dental Service, and Walter J. Kmen, DDS, Staff Dentist, VA Hospital, Montrose, N. Y.)

In testing the vitality of teeth with an electric pulp testor, the contact between the electrode and the tooth is dependent on moisture on the tooth. Since moisture

on a tooth is difficult to localize and is not necessarily uniform in electrical conductivity, variable readings are often obtained.

It is suggested that electrode jelly, routinely used in electrocardiography or electroshock therapy, be used to provide the contact between the tooth and the electrode instead of moisture. This electrode jelly has uniform composition and is an excellent conductor of electricity.

A strongly colored dye, such as gentian violet, should be mixed with the jelly to make the jelly readily visible on the tooth. The tooth is dried and a small quantity of the colored jelly placed on the tooth or on the tip of the electrode if a unipolar type is employed. The test is then carried out in the routine manner.

"Improved 'Ice Bags' For External Application Following Oral Surgery"

Employee Suggestion No. 5240-S-157
(Submitted by Lee K. Juhl, DDS, Staff Dentist, VAH, Sepulveda, Calif.)

Most difficult oral surgical procedures involve some degree of unpreventable trauma. In these cases, the application of cold compresses or ice bags to the face is often indicated to prevent or to reduce swelling and for the relief of pain.

To be most effective, external cold applications should be used immediately following the operation. This may be effectively and conveniently accomplished in the following manner. A number of 3" by 4" plastic bags are partially filled with water and sealed. The bags are placed in the freezing compartment of a refrigerator and frozen. A convenient stock of ready frozen external applications may thus be kept available for immediate use. The bags should be wrapped in a paper towel before being applied to the face of the patient.

The procedure permits prompt application of the therapy, requires very little time of the dental assistant, and relieves the ward nurse of the task of preparing an ice bag for the patient when he is returned to the ward.

"An Improved Method of Autoclaving Dental Hypodermic Syringes"

Employee Suggestion No. 5057-S-560
(Submitted by Harley H. Cox, Dental Technician, VAH - Knoxville, Iowa)

This suggestion concerns preparation of the assembled dental hypodermic syringe, hub, and needle for autoclaving.

This method consists of a previously prepared tongue blade having an empty anesthetic carpule attached to its lower end and parallel to the blade itself. At the upper end of the blade, a cloth tape is fastened by threading through two parallel holes in the wood. The assembled syringe, with the needle

extending into the glass carpule, is then securely fastened to the tongue blade by means of the cloth tape. The entire unit is wrapped and autoclaved.

This device is intended to save time for the dentist, as well as preventing distortion and burning of the needle, and accidental contamination of the sterile unit.

"Loading Cup for Amalgam Gun"

Employee Suggestion No. 5112-S-135
(Submitted by Edgar A. Swoboda, DDS, Staff Dentist, VAH - Lincoln, Nebr.)

A loading cup has been designed which permits quick, easy, one-hand loading of an amalgam gun or plunger-type carrier. This device is a round plastic block with an inverse cone top which forms a narrow, shallow well within the block.

A wax button, the depth of the desired well, and of sufficient diameter to admit the tip of the amalgam gun, is attached to the tip of a sprue former. A stone die is made of the sprue former and button, and a wax box is built up around the die to form a wax pattern of the cup. The resulting wax model and die are flasked, packed in acrylic, and processed to completion.

This device not only affords an easy one-hand method of loading the amalgam gun by the dentist or assistant, but also results in less waste of alloy. Smaller mixes are possible since confinement in the well avoids scattering .

"Color Code for Instruments"

Employee Suggestion No. 5032-S-224
(Submitted by Edwin F. Irish, DDS, Staff Dentist, VAH, Washington, D. C.)

When central sterilization facilities are used in a clinic, the return of instruments to the correct drawer and cabinet is often a problem.

This suggestion indicates the use of colored plastic sleeves on the handles of the instruments with two colors to an instrument—one color will denote the cabinet and the other the drawer.

"Acrylic Center for Cloth Buffer Wheels"

Employee Suggestion No. 3021-S-604
(Submitted by Noel V. Brodtmann, Dental Technician, VARO, New Orleans, Louisiana)

The center hole of a cloth buffer wheel is packed with self-curing acrylic. When it begins to set, a chuck, with the tip lubricated, is turned into the acrylic and held at right angle to the wheel until the acrylic has set.

"Prevention of Cross-Contamination in Exposing Dental X-Rays"

Employee Suggestion No. 5254-S-457
(Submitted by Mrs. Lucy Murphy, Dental Assistant, VAH, Wilmington, Delaware)

A clear plastic bag approximately 7 x 9 inches is used to cover the x-ray timer for each patient.

"Material for Construction of Impression Trays"

Employee Suggestion No. 5260-S-654
(Submitted by Mr. Floyd O. Blunt and Mr. Nyal J. Thompson, Dental Technicians, VAH, Kansas City, Mo.)

A mixture of 5 parts of plaster of Paris and 6 parts of acrylic resin powder is used in construction of individual trays. This mixture is much less expensive than a pure acrylic tray. It has a longer setting time, equal strength, and is easier to trim.

Argentia Dental Officers Host Newfoundland Dental Society. Officers of the Dental Department of the Naval Station, Argentia, Newfoundland, recently entertained members of the Newfoundland Dental Society. Dentists from all sections of the island including Grand Falls, Cornerbrook, Gander, and the capital, St. John's, attended.

Dental officers presented a professional program of lectures and clinics, followed by a tour of the station and a visit to the Airborne Early Warning Squadron 13.

The visiting doctors had lunch at the B.O.Q. and concluded a busy day with dinner at the officers' club.

The scientific program included:

Capt W. E. Crolius, DC, USN, Senior Dental Officer ..... Oral surgery and the maxillary sinus.

Capt R. H. S. Scott, DC, USN ..... Full denture technic with special emphasis on peripheral adjustment and equilibration at time of insertion.

Lt Richard Dixon, DC, USNR ..... Transplantation, case presentations.

Lt John B. Lathrop, DC, USNR ..... Replantation, case presentations.

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OCCUPATIONAL MEDICINE

Freak Helium Accident Inflates Man's Arm

Hazards Control, Information Exchange Bulletin, University of California, Lawrence Radiation Laboratory, P.O. Box 808, Bldg. 144, Room 188, Livermore, Calif., Vol. 2, No. 6, June 1962.

An engineering coordinator decided to check the flow of helium from an orifice in a high-pressure line by placing his finger over the small opening. When he did so, the flow of gas pierced the skin and penetrated the flesh as far as the armpit. When the patient arrived for medical treatment, his finger was swollen and pale. The back of his hand was also swollen and gas pressure could be felt through the skin along the arm. Relaxing incisions were made in the finger to release the gas. A sympathetic block was required to begin circulation to the finger. Recirculation was restored gradually and the helium gas in the arm was absorbed after 4 days. Recovery was satisfactory. Six work days were lost. Fortunately, helium is chemically inert and caused no further complications.

The gas pressure involved in this accident was 6000 psi. The square-edged orifice was 0.007 inch in diameter and 0.20 inch thick. Theoretically, an isentropic expansion would occur. The following calculations give approximate values. Helium leaking through this opening would reach a sonic speed (in helium) of 2800 feet per second (1900 miles per hour, or about the muzzle velocity of an M-1 rifle.) At the opening of the limiting orifice, 0.0005 cu ft/second of helium at a pressure of 3000 psi would be discharged. Thus, when a finger was placed against the orifice, a virtual needle of helium traveling at sonic speed and at a pressure of 3000 psi would be injected into the finger. This helium would then expand 200 times in the tissue resulting in a potential inflation rate of 0.1 cu ft/second (3 quarts per second).

This incident vividly points out the hazard of flowing high-pressure gases. Compressed gas streams, whether at 6000 psi or 60 psi, can be dangerous. A good rule to follow is: never allow compressed gases to come into contact with your body.

Although we lack specific case histories, injuries due to skin puncture by compressed gas streams are apparently known. A parallel case is one in which grease was injected into the flesh of the hand from a high-pressure grease gun.

Perchloric Acid Ventilating System Hazards

Hazards Control, Information Exchange Bulletin, University of California, Lawrence Radiation Laboratory, P. O. Box 808, Bldg. 144, Room 188, Livermore, Calif., Vol. 2, No. 6, June 1962.

During routine maintenance involving partial dismantling of an exhaust blower on a perchloric acid fume ventilating system, a mechanic tapped part of the blower with a 6-inch chisel. This light blow initiated an explosion heard 4 miles away. Three employees were in the vicinity at the time. One sustained face lacerations and a slight eye injury. A second suffered loss of four fingers on one hand plus multiple face lacerations and possible loss of sight in one eye. The third was injured fatally by the chisel.

Prior to this incident, similar (but less violent) explosions on comparable operations were experienced elsewhere during 1959 and 1960. As a result, one AEC contractor used safety shields while performing this type of maintenance. During subsequent work on 4 other blowers, 4 more explosions occurred. In these cases, however, the safety shields prevented injury to employees. Information on these accidents, compiled by the AEC, is summarized as follows:

1. In all cases, the blowers which exploded were used to exhaust laboratory hoods. The explosions are believed to be due to the formation of explosive compounds from reactions between perchloric acid fumes and a litharge-glycerin cement. However, other reactions involving laboratory reagent fumes may have been contributory.
2. All blowers involved in the explosions were exhaust fans. On this particular type of blower (the manufacturer reports), the cement is composed of litharge and glycerin. It appears that this cement undergoes some reaction with perchloric acid fumes to form an explosive compound which is highly pressure-sensitive. If this model fan is used in perchloric acid service, the manufacturer now recommends that the litharge-glycerin cement be removed from the blower housing and that the rear face plate be sealed with inert cement. The following mixture is suggested:

   92 ounces silica flour
   1/4 ounce sodium fluosilicate (accelerator)
   sodium silicate (water glass) sufficient to make a stiff paste
3. We know of no explosions with other makes of fans or blowers. Since perchloric acid reacts with organic-bearing materials to form explosive compounds, we recommend that you carefully examine your laboratory hood exhaust system for presence of wood, rubber, plastics, or other organic construction materials. If such materials are present, remove them; first provide adequate safeguards to protect maintenance personnel. Also, regard with

suspicion the use of corrosion-resistant or other paints on blower housing and duct interiors.

4. Frequent hosing down of ductwork and blowers is not a guarantee against explosions. One explosion occurred even after the blower was soaked in a soda ash solution.
5. Spontaneous explosions must be regarded as a distinct possibility. Caution maintenance personnel against accidentally striking the plate or sealing compound with tools. Stencil or tag each blower conspicuously to indicate this hazard.
6. To guard against injury to maintenance personnel, the following practice was devised:

   The equipment was removed to a safe area. A steel shield was erected and fastened to the fan housing. A sandblast nozzle was fastened to a crank inside the shield. Sandblasting, controlled from behind the protective barrier, effectively removed the sealer.

Standard references for the safe handling of perchloric acid include National Safety Council Data Sheet No. D3-111 (NSC No. 123.04-311); Manufacturing Chemists' Association, Inc., Chemical Safety Data Sheet SD-11; and the publication of the G. Frederick Smith Chemical Company, Columbus, Ohio entitled "Perchloric Acid," Volume I (Fourth Edition).
(Above article condensed from USAEC Serious Accidents, Issue No. 184, dated 20 June 1962.)

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The Closed Chest Method of Cardiopulmonary Resuscitation - Benefits and Hazards

Journal of Occupational Medicine, 55 E. Washington Street, Chicago 2, Illinois, 4(9):492, September 1962.

An original statement on the closed-chest method of cardiopulmonary resuscitation prepared by the American Heart Association has been revised to incorporate recommendations of an Ad Hoc Committee of the Industrial Medical Association appointed for this purpose. In its present form this statement is subscribed to by the Industrial Medical Association, the American Heart Association, and the American National Red Cross.

In view of the growing interest in the closed chest method of cardiopulmonary resuscitation, and the possible dangers in its indiscriminate use, the following statement has been prepared as a guide to the public regarding the present place of this new technique:

The closed chest method of cardiopulmonary resuscitation has been proved effective as a medical procedure in certain cases of stoppage or disruption of the heart beat. However, it is to be considered a temporary method and additional medical treatment, which may include the use of drugs and an electric defibrillator, is usually required to restore the circulation permanently.

The heart beat may stop as a result of a variety of conditions or circumstances such as water submersion, electrical shock, asphyxiation, heart attack, or during anesthesia or surgery. Most people who experience sudden stoppage or disruption of the heart beat (cardiac arrest) cannot be saved even under ideal circumstances in a hospital. The least measure of success has been experienced in coronary heart "attack" cases. However, the prompt use of cardiopulmonary resuscitation has enabled lives to be saved which previously might have been lost. The new technique of closed chest cardiac massage makes it possible to continue blood circulation without opening the chest, thus greatly extending the possibilities for attempting saving of life. Consequently, it is the desire of all concerned to achieve widespread use of this method where it can be used safely and effectively.

The public should be advised, however, that the application of closed chest cardiopulmonary resuscitation calls for a working diagnosis of the victim's condition. It is important to be sure that the circulation has actually stopped because the method involves certain hazards. Reported injuries to patients have included damage to the heart and liver, internal bleeding, multiple rib fractures, and puncture of the lungs. In untrained hands the risk of injury is increased. It is particularly important to avoid the possibility of inflicting serious injury on a person under the mistaken impression that cardiac arrest has occurred when the individual has simply fainted or lost consciousness from some other cause.

Successful application of closed chest cardiopulmonary resuscitation depends on thorough and careful training. One is most unlikely to be able to achieve artificial blood circulation by this method if his only training is from reading written instructions.

In view of these facts, it is suggested that closed chest cardiopulmonary resuscitation be applied only by carefully trained personnel so that it may be utilized with the greatest safety and effectiveness. Two qualified persons are preferable because it is necessary to maintain artificial respiration at the same time the heart is being massaged externally. A decision as to whether training in this procedure should be extended to certain segments of the general public must be postponed until further experience accumulates.

The organizations joining in this statement believe that emphasis should be placed at this time in training physicians, dentists, nurses, and specially qualified emergency rescue personnel so that the procedure will become more widely available.

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Massachusetts Experience with Toluene Di-isocyanate

Hervey B. Elkins, George W. McCarl, Heinrich G. Brugsch, MD, and John P. Fahy. Amer Industr Hyg Ass J 23(4), July-August 1962.

Recent reports indicate that the production of polyurethane foam in the U. S. A. has risen from 8 million pounds in 1956 to an estimated 115 million pounds in 1960; it is expected to reach 356 million pounds by 1966. Polyurethane obtained

by polymerization of organic isocyanates is utilized in rigid and flexible foams, and in somewhat smaller quantities in finishes, molded goods, adhesives and other products.

The isocyanate most widely used in polyurethane production is toluene (tolylene) di-isocyanate (TDI). Of other di-isocyanates, diphenyl methane di-isocyanate and naphthalene di-isocyanate, which are less volatile than TDI, appear to be much less hazardous, while hexamethylene di-isocyanate is not only 5 times more volatile than TDI but is apparently of greater toxicity.

Experimental Data

Various authors have carried out experimental studies with TDI in animals and man. Friebel and Luechtrath demonstrated that undiluted TDI applied directly through the trachea of guinea pigs causes extensive destruction of the respiratory mucous membranes, while inhalation of an aerosol containing TDI in dilution 1:50 for 10 to 20 minutes produced coughing spells, which in 5 of 7 guinea pigs studied were "of transient asthmoid character." All authors agree that in animal experiments on monkeys, dogs, guinea pigs, rats and mice, prolonged inhalation of high concentrations of TDI leads to irritation of the eyes and respiratory tract with tracheitis, bronchitis, pneumonia and pulmonary edema in some instances.

In addition to a local irritation on contact with skin, respiratory mucous membranes and gastrointestinal tract, the possibility of a sensitizing effect of TDI has been studied in view of pertinent clinical observations. Zapp states that "it was possible to produce allergic skin sensitization of guinea pigs with TDI." However, the same author was unable to demonstrate skin sensitization through patch tests applied after an interval of 10 days to 209 individuals.

Clinical Observations

The first report describing the characteristic symptoms and signs of TDI intoxication after inhalation of TDI vapors was published by Fuchs and Valade in 1951. Their observations are now well documented in publications from Europe, Asia and North America. A review of the literature available to the authors shows that through 1960, 16 papers (12 foreign, 4 American) covering 222 cases have appeared in print, and undoubtedly additional observations by plant physicians have remained unpublished.

The clinical signs of TDI intoxication observed by the authors ranged from mild upper respiratory distress with itchiness of eyes, coryza, sore throat and cough to definite signs of inflammation such as conjunctivitis, tracheitis and bronchitis. Fifty-four out of 222 cases were more severe and a frequent complaint was a particularly distressing tightness of the chest noted at the end of the work day, often severe enough to call for immediate medical assistance and to cause sleeplessness. Nausea and vomiting were also complained of by some patients. In addition to these findings there are reports on

record of fairly dramatic incidents suggestive of bronchial asthma, "asthmoid reaction" or bronchiolitis. Baader states that he knows of 4 deaths in conjunction with TDI intoxication and 3 cases observed by German authors, were followed by chronic cardiopulmonary disease which in two instances led to death from cor pulmonale. Some workers exposed to the vapors of TDI in higher concentrations showed on subsequent re-exposure a particular sensitivity to TDI with a tendency to recurrent "asthma" severe enough to force them to withdraw from even minimal exposure to TDI vapors.

Reports of cases occurring in 15 Massachusetts plants are included in the original article, giving typical air concentrations of TDI found on surveys.

Discussion

The medical observations made in Massachusetts closely parallel those made elsewhere. The irritating effect of TDI vapors leading to itchiness of the eyes, stuffy nose and dry or "sore" throat, were commonly found in plants where concentrations of TDI vapors are seemingly adequately controlled according to previous standards. With prolonged exposure to slightly elevated concentrations of higher concentrations more distressing, sometimes disabling symptoms and signs such as conjunctivitis, bronchitis, nausea and vomiting appeared. Perhaps the most characteristic symptoms suggestive of a significantly high exposure were tightness of the chest at the end of the work day with nonproductive cough, restlessness and inability to fall asleep. At this state some patients showed a slightly elevated temperature (up to 100° F by mouth), increased pulse rate to about 100, and rales or rhonchi over one or both lungs. A diagnosis of bronchitis was usually made, although the possibility of angina pectoris was raised in 2 of the cases here reported. X-ray films of the chest taken at an early date were interpreted as negative; later, increased lung markings or pneumonitis were found.

This initial state of upper respiratory distress was sometimes followed by sudden attacks of bronchospasm. The characteristic features of bronchial asthma were then noted, requiring relief by oxygen or antispasmodic medication. The allergic nature of the condition has not been clearly established but has been suggested in several instances by an elevation of the blood eosinophils from 7 to 13%. Several workers with this type of bronchial asthma when exposed again to TDI vapors suffered recurrent attacks and thus became unfit for work under TDI exposure even at air concentrations below the MAC.

An important feature of TDI exposure, hitherto little known, is that under unfavorable circumstances the chemical can cause a serious state of collapse, as shown in the observation from Plant 10 reported here. It appears likely that this additional pulmonary stress may lead to right-side heart failure with danger of prolonged or even permanent pulmonary insufficiency in individuals with chronic bronchitis. Workers in the higher age bracket are more likely to fall into this group.

The medical management in control of TDI exposure should not only provide relief from irritation of eyes and respiratory tract or alleviate any

state of allergy, if proven, but also anticipate the possibility of right-side cardiac failure and pulmonary congestion.

Maximum Allowable Concentration

The authors relate that the only conclusion they can draw from these findings is that 0.1 ppm is much too high as a MAC for TDI. They do not see how any objective observer can arrive at any other conclusion, given the same data. In only one of 10 plants were concentrations above 0.1 ppm found. The findings in this plant suggest 0.1 ppm would be more logical as an MAC for eye exposure than for inhalation. In general our results indicate that for unprotected workers 0.01 ppm is not an unreasonable limit.

The writers did not arrive at this conclusion hastily, but stayed with the 0.1 ppm value after studies at 3 plants (where cases had occurred) indicated that the concentrations were on the average less than a fifth this level. Nor did they base their opinion on one or two isolated cases. Excluding Plants 1, 10, and 11, where high concentrations were found in one case, there are a total of 30 accepted or established, and an additional 70-odd disputed cases.

While only the more serious cases can be attributed without reservation to TDI exposure, the nature of the other cases, the calibre of the medical observers who reported them and the relationship of symptoms to exposure make a strong argument in favor of TDI intoxication, in the cases here summarized.

Were their tests representative of actual exposure? In some cases, Plant 10 certainly; probably in Plant 8; and possibly in Plant 3 they were not. Based on the authors' long experience in industrial air analyses, it is their opinion that the other results give a reasonably true picture of the average, if not the worst conditions.

Were their analytical procedures reliable? Most of their tests were with the Marcali method. The company tests at Plant 2, however, were made with the Zapp-Ranta method which was tried but rejected because of inadequate sensitivity. They also tried and rejected, for the same reason, a method described by Robinson using a reaction with p-dimethylaminobenzaldehyde. Reasonable agreement was obtained between the Marcali method and the other 2 procedures when comparative results were obtained.

Were other irritants responsible for the cases in question? In most of the plants there were other vapors (e.g. solvents, or fumes from heated oil or plastic) which could cause irritation to the nose and throat. In addition many of the polyurethane mixtures contained ingredients in addition to TDI which were irritating or otherwise toxic, but these were usually present in small amounts. The common denominator, in all cases, was toluene diisocyanate, and it appears probable that it was mainly responsible, although other fumes and vapors may have contributed, particularly in Plant 4.

What has been the experience of others? Of the published reports only those of Walworth & Virchow and Hama tabulated data on TDI vapor concentrations in workroom air. The first of these reports describes extensive tests

in a plant where 83 cases had been reported. Average TDI levels ranged from 0.16 to less than 0.01 ppm. While the authors concluded that there was no close relation between illness and TDI concentration, the maximum incidence of cases occurred when the average concentration was about 0.1 ppm whereas very little trouble was noted at 0.01 ppm. Hama found concentrations of 0.03 to 0.07 ppm associated with a high incidence of illness, but no trouble with levels below 0.03 ppm.

Skonieczny reported several cases of respiratory irritation in plants where TDI concentrations were well below 0.1 ppm. Inquiry of the experience at 2 large rubber companies elicited the information that no trouble resulted from concentrations described as "considerably below" and "well below" 0.1 ppm. One company had had some trouble, "chiefly" above 0.1 ppm, but considered this concentration too high for sensitized workers.

Ehrlicher, in a paper published in May, 1956, states that additional data are necessary before the validity of 0.10 ppm as the MAC can be established. In a paper published several months later with Pilz, the same author states that 0.10 ppm level has been confirmed, and that concentrations as high as 0.30 ppm can be tolerated for some hours without injury.

In a summary published in 1961, Ehrlicher lists 0.10 ppm as the MAC without comment.

On the other hand, Munn, while he gives no data on TDI vapor concentrations associated with cases, states the opinion that 0.10 ppm is too high except for short exposures.

Stevenson, however, reports no adverse effects in 30 workers exposed for up to 30 months to concentrations of TDI vapor ranging up to 0.18 ppm and averaging 0.04 ppm.

In the writers' opinion the above reports do not substantiate the 0.1 ppm MAC. On the contrary, concentrations of 0.1 ppm are usually associated with illness.

How substantial is the evidence for the 0.1 ppm limit? This appears to have been first proposed in 1954 by Ayscue of the Haskell Laboratory on the basis of animal experiments as a tentative value. A technical publication (Strayer, et al.) 2 years later states that the 0.1 ppm MAC has been set, and it is believed no toxicity problem exists below this concentration. In a 1957 paper by Zapp it is stated that the maximum concentration in the air should not exceed 0.1 ppm, based on the adverse response of animals to concentrations of 1 to 2 ppm.

The Threshold Limits Committee of the A. C. G. I. H. adopted 0.1 ppm as a tentative limit in 1956. In 1959, this was changed from a tentative to a recommended value. In 1961, based in part on the data presented above, the value was changed to 0.02 ppm.

The only other pertinent fact we have bearing on this matter is the Russian recommendation of 0.07 ppm published in 1959.

As the authors see it, the 0.1 ppm value is based entirely on extrapolation of animal experiment findings from a considerably higher value. No data on human exposure which really support this level has come to their attention. The correct value cannot be definitely ascertained without additional data.

RESERVE SECTION

Address by Vice Adm. William R. Smedberg to the Naval Reserve Association, New Orleans, Louisiana, 4 October 1962.

Mr. Chairman, distinguished guests, members of the Naval Reserve Association, ladies, and gentlemen, this is a happier occasion for me than was my last visit here, just 6 years ago this month. As Superintendent of the U. S. Naval Academy at that time, I brought an undefeated football team to New Orleans, was wined and dined at Brennans by my Tulane hosts—spoke at the Navy Day luncheon at the Roosevelt Hotel and then saw my team clobbered by Tulane; a far cry from the famed New Orleans gracious hospitality.

This time we are all on the same team, which makes it particularly pleasant in this beautiful city; known as a Navy town. Appropriately indicative of this is the proclamation of Mayor Schiro, naming this week of the Naval Reserve Convention, Naval Reserve Week.

This action shows clearly the pride in the Naval Reserve of this city which, in last year's callup of the Reserve, provided two ASW Reserve ships, Huse and Woodson, and VS Squadron 822. It is obvious why New Orleans is known as a Navy town.

The units from New Orleans were a part of the total of 40 ASW ships and 188 aircraft called up. Last year's recall demonstrated completely just how dependable and effective is our Naval Reserve, particularly the Ready Reserve.

As the Chief of all naval personnel, I want to express my personal appreciation to your association whose members participated in last year's callup and whose support particularly in the days between notification and reporting for active duty was extremely helpful.

We appreciate such problems and must do something about them. Aspects of the Naval Reserve program will be dealt with more extensively during your convention by the members of my staff, by Admiral Becton, by Admiral Martin, and others concerned with the Naval Reserve who are sharing in your convention.

Those of you who have been on active duty recently and those who keep up with the Navy, are aware of most of our problems and by "our problems" I am speaking of the Regulars and the Reserve because together they comprise the Navy's strength.

However, some comment on the impact of present-day and future technology of our Navy seems in order.

The Navy is in the middle of a technological revolution greater than the transition from sail to steam or from cannonball to steel-jacketed projectile,

and we are trying to compress today's awesome transition into about 10 years, not 50. There is no time for unhurried, normal peacetime development.

Consider the transition from high explosive to nuclear explosive, from oil to atomic engines, from gunfire to missiles, from low-performance to high-performance aircraft, from human to computer calculations.

There is no foreseeable leveling off in this pace. On the contrary, all signs point to an acceleration in pace.

Even now the Navy has not yet felt the full impact of the research done in the decade of the 1950's. It is already clear that the research of the 1960's is growing and will continue to grow in volume, breadth and depth. We do not know exactly what great advances will come from this research, but we do know that we have to be prepared to keep up, by education and training.

Perhaps we are endeavoring to accomplish this epochal transition too fast. Regardless of the rapidity of this transition, I am convinced that our major problem over the next few years concerns personnel. How do we attract young officers and enlisted men who have the mental capacity to absorb sufficient knowledge to enable us to operate and maintain these ships? Once we attract these individuals, how do we retain them in the Navy?

In addition to potential, professional competence, they must also be dedicated people, convinced that they are making important contributions to the security of this Nation.

Getting competent people is a tough problem. Retaining them is a tougher one.

It is tougher because by the time we get a young man trained and with sufficient experience to be a solid contributor to this technological navy, his first enlistment expires. At this point in time, when we particularly need to retain this lad in the Navy because of his competence and skills, our rapidly expanding American technological industries also want him. Often their lures, better pay, shorter work hours, more time with the wife and children, are very effective.

How well are we meeting this problem of retention; of persuading sufficient numbers of alert young officers and enlisted men to accept the Navy as a career? Of persuading others to keep their skills and loyalties alive in the Naval Reserve against a national emergency?

Not too well, frankly—we are falling rapidly behind in the critical, technical skills, our Reserve program is sagging.

It is up to us—Regulars like myself and you leaders in the Reserve—to see to it that a naval career is made more challenging and attractive, our Reserve more worth while.

No one in this room fails to recognize the need for strong Armed Forces now and for the foreseeable future.

Just 1 week ago today, General Lemnitzer who was about to leave his assignment as Chairman of the Joint Chiefs of Staff for his new duty as the Supreme Allied Commander, Europe, stated in Washington at the National Security Industrial Association annual dinner:

"This Nation will not diminish its efforts or its determination to stay ahead of the gigantic conspiracy which has declared war on our civilization,

our way of life, our social forms, our moral and ethical values. The emptiness and brutality of communism is best summed up, for all the world to see, by the wall in Berlin. No space spectaculars, however shrewdly exploited, should be allowed to obscure this stark testimony of the failure of communism or of the barrenness of its promises."

The men and women of our Armed Forces today, stationed all over this globe, are showing the rest of us daily by their dedication, their professional competence, their uncomplaining performance in the face of hardship, separations, personal sacrifices—and even danger and death in some areas—that they have faith in the destiny of the United States and the cause of freedom which it champions.

We are a fortunate Nation to have men and women such as these. It is on them, their skills, their high resolve and devotion to duty, that our survival ultimately depends—not on any weapon or machine, no matter how ingenious or complex. The least that we owe them is respect and consideration. Money cannot buy such men and women, as it buys machines and weapons. We must develop them—slowly, carefully, patiently, with pride—from our American homes and families. We must see to it that those in the military forces which insure the security of this Nation are in respected occupations; that they have prestige, reasonable remuneration, and recognition for the services they provide.

I think all of us need to think less about how to make money, less about shorter hours of work and longer vacations, and a great deal more about our responsibilities to our country, about serving that country and our fellows.

That, I think, is now and will remain for a long time the biggest and most crucial job for all Americans.

One American family understands, as illustrated by a letter which was forwarded to me from the White House day before yesterday.

It was from a mother of a son in the Navy to the President of the United States. I'll read it:

"Dear Mr. President: As President of our country and Commander in Chief of our Armed Forces, I believe you will be most interested and very gratified by the copy of a letter from my son who is in the Navy.

"He is an electronics technician on board a carrier in the Pacific. He received this assignment in March of this year, and this was the time of the unrest in Vietnam. I was very upset when I knew he would be going there. This is his answer to my letter.

"I can truthfully say, after reading it, I was ashamed of my feelings. He is a fine boy and I need not tell you how proud I am of him.

" 'Now, about going overseas. True, the Vietnam situation is shaky, but our whole job in the Navy is to protect the sea lanes. This is not the reason the Midway is going overseas, we just happen to be the next crew due to go and unfortunate as it seems to our families there is such a thing as Vietnam now.

"'You at home should remember this—it's my whole aim in life now—I'm a "fighting man," my job is the defense of my country, even if it means the giving of my life, it is for one sole purpose, to maintain at all costs, and preserve with all my skills, the freedom and rights to these freedoms, to live

as we please, for all my family. Of course, foremost in my mind is my son and the child my wife is carrying.

" 'I will readily and willingly give up my life in the defense and preservation of my beliefs. I only hope that if it should happen, that those who follow will not let me and others like me go down in vain.

" 'This is the example I will set for my sons and their sons.

" 'Maybe this example throughout my life and when they grow older, will help them to understand why some men choose to be doctors, firemen, lawyers, baseball players and sailors.

" 'I feel that communism is the biggest moral and military threat we have ever known. They must be stopped everywhere possible.

" 'This country is a fine place to live, it's just as free as when Thomas Jefferson signaled the birth of a nation with the Declaration of Independence, but as free as it is, the more lax we have become.

" 'We know so little of communism.

" 'Please remember, mom, these are my feelings. You couldn't hold me back with a team of horses, now. Vietnam is a faraway place to most people, but very real to me.

" 'So, as the old saying goes—America, sleep well at night, your shores are protected by your Navy. So don't worry—it's all for a good reason—your freedom, my freedom, and God's hand will guide us.' "

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Wearing of Uniforms by Retired and Naval Reserve Personnel* (concluded)

Uniforms Required by Reserve Personnel Not on Active Duty

1. Officers and Warrant Officers of the Naval Reserve not on active duty are required to possess the following, with necessary accessories:

a. Male Officers

Item	Quantity
Uniform, Service Dress, Blue	1
Uniform, Service Dress, White	1
Uniform, Service Dress, Khaki	1
Uniform, Working, Khaki	1
Overcoat, blue or raincoat, blue	1

b. Women Officers

Uniform, Service Dress, Blue	1
Uniform, Service Dress, White	1
Uniform Service Dress, Light Blue	1
Overcoat, blue or raincoat, blue	1

c. All other uniforms prescribed for officers of the U. S. Navy are optional for officers of the Naval Reserve not on active duty, but such uniforms, when worn, must conform to regulations and must be worn as prescribed for officers of the Regular Navy.

2. Merchant Marine Officers Appointed to Commissioned Grade in the U. S. Naval Reserve. —Such officers employed on vessels requiring their officers to wear uniforms, may be permitted to wear such uniforms while performing active duty for training.

3. Enlisted Personnel. —Enlisted personnel on inactive duty and active duty for training shall wear uniforms as prescribed by the Bureau of Naval Personnel in separate instructions.

Uniforms Required by Reserve Personnel on Active Duty

1. When ordered to active duty other than training duty, Reserve personnel shall provide themselves with the same minimum outfit of uniforms and accessories as is prescribed for equivalent personnel in the Regular Navy, except that Reserve officers are not required to possess the sword, sword accessories, or the Dinner Dress, Blue Jacket or White Jacket Uniforms.

Insignia Worn by Student Reserve Officers

1. Medical students, dental students, and theological students appointed Ensign USNR in the Ensign (1915), (1925), and (1945) programs shall wear the same corps device prescribed for officers of the corps to which, upon graduation, they will be assigned for duty.

* (From: U. S. Navy Uniform Regulations)

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